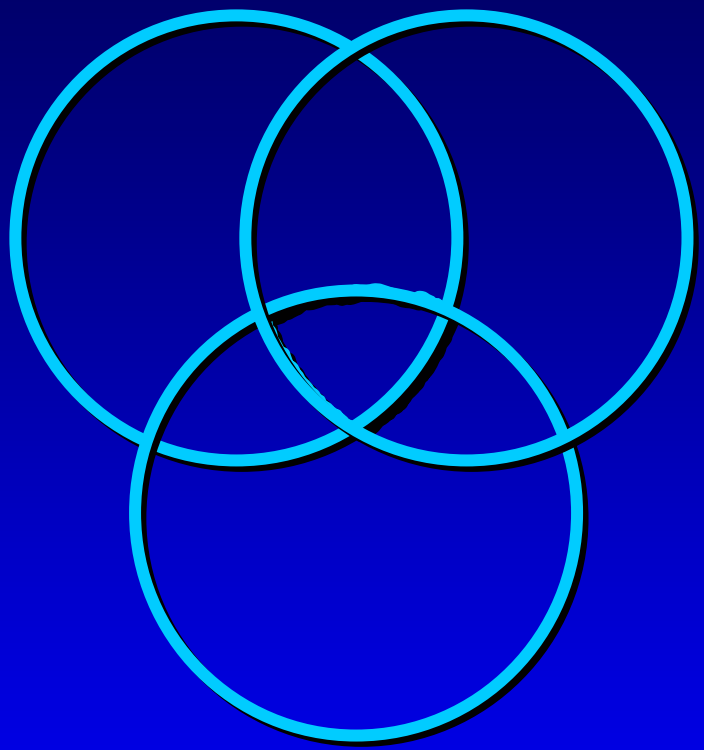


Rehabilitation Research and Training Center on Aging with Spinal Cord Injury

Rancho Los Amigos National Rehabilitation Center

Funded by the National Institute on Disability and Rehabilitation Research

Cardiovascular and Metabolic Risk Factors in Persons Aging with SCI

- CVD is a leading cause of mortality in those with SCI. The prevalence of CVD risk factors has been well established in this population; however, the incidence of CVD has not.

Risk Factors

- Age
- Male
- Abnormal Glucose Metabolism
- Abnormal Lipid Profile
- Cigarette Smoking
- Hypertension
- Sedentary Lifestyle

Emerging Risk Factors

- Metabolic Syndrome
  - Abdominal Adiposity
  - Impaired Post-prandial Glucose Metabolism
  - Increased Triglycerides

Prevalence of Cardiovascular Disease in SCI

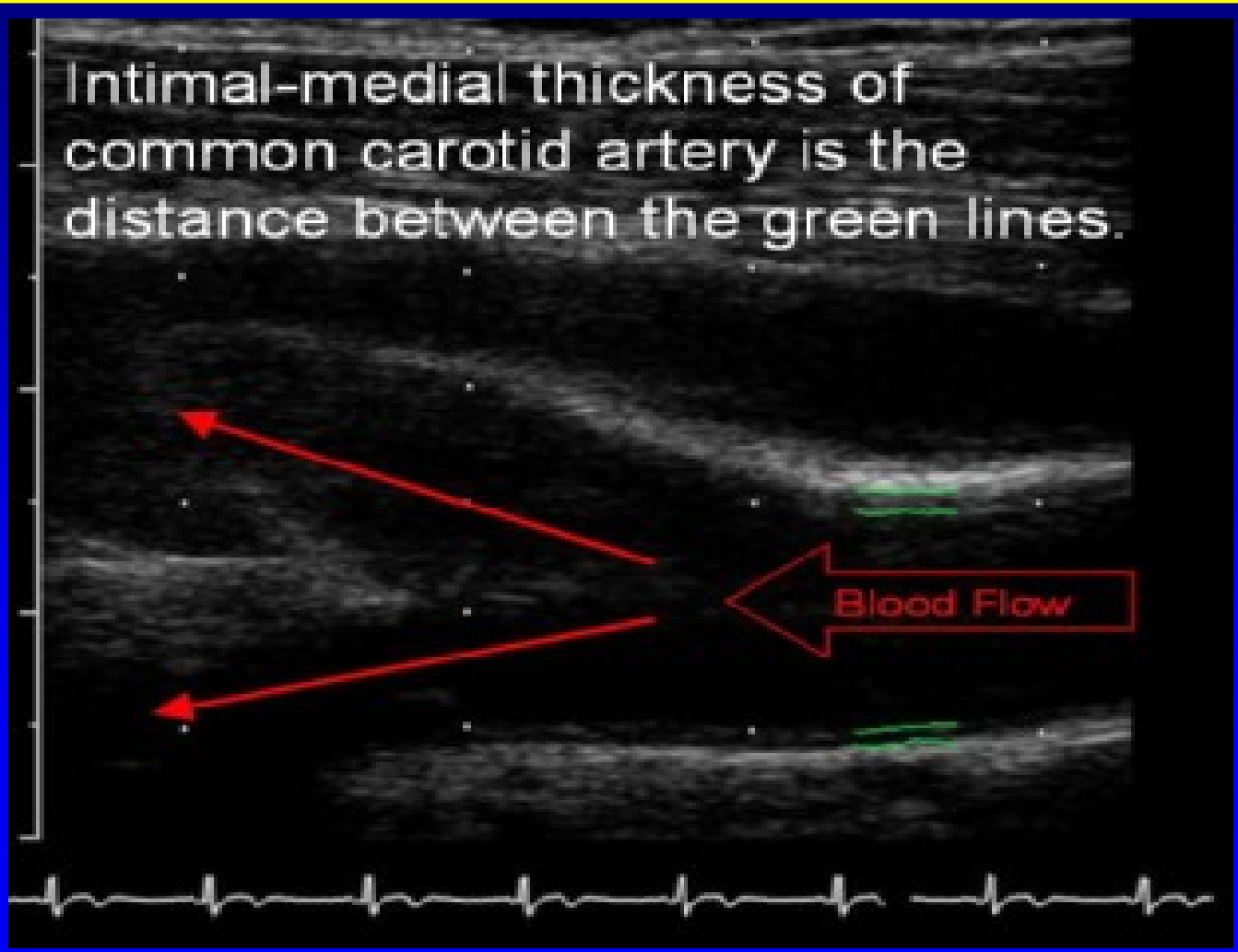
- Not well established
- Atypical presentation of CVD
- Lack of sufficient epidemiologic CVD data in SCI

Update

- Intima/Medial Thickness (IMT) of Carotid Artery wall

Intima/Medial Thickness (IMT) of Carotid Artery wall

- Surrogate for CVD in epidemiologic studies
- Non-invasive
- Reliable & Reproducible


Intimal-medial thickness of common carotid artery is the distance between the green lines.
Blood Flow

Factors Influencing IMT in SCI

- Age
- Abnormal Glucose Metabolism
- Triglycerides

Update

- Women Cardiovascular Health

Participants

N=122

Mean Age	43.1 ± 11.1 Years
Mean Duration	16.4 ± 10.8 Years

Race/Ethnicity

37 Caucasian; 24 Black; 55 Hispanic; 4 Asian; 2 other

Impairment –

17 Complete Tetraplegia
20 Incomplete Tetraplegia
51 Complete Paraplegia
34 Incomplete Paraplegia

One Goal

To Ascertain whether Certain Factors Associated with, or Measures of, Cardiovascular and Metabolic Health would serve as Potential Predictors of Satisfaction with Life Among Women with SCI

Potential Predictors of SWL examined Included:

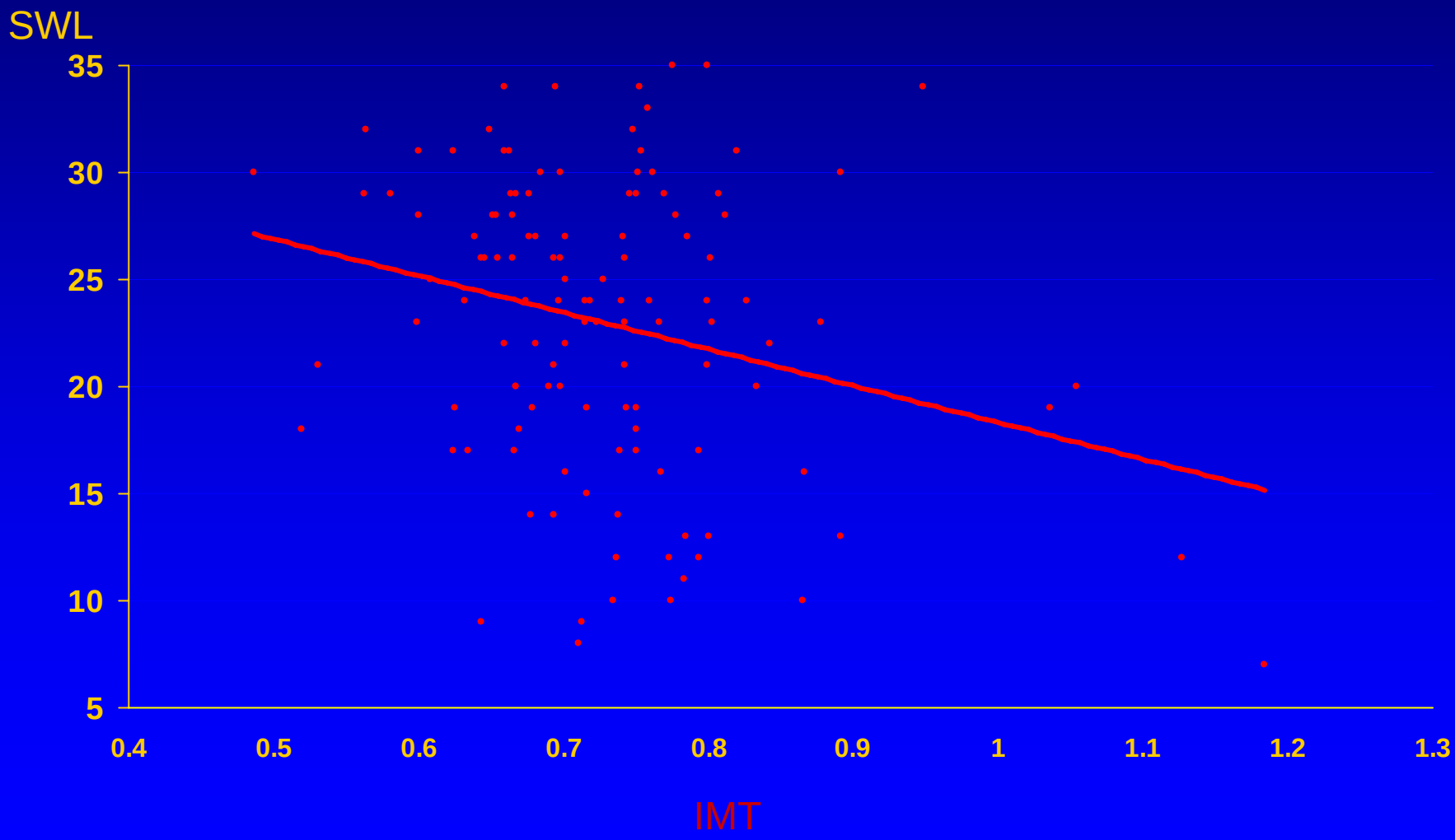
- Age
- Duration of Injury
- Race/Ethnicity
- Impairment
- Serum Lipid Levels
- Fasting Blood Sugar
- Hemoglobin A1c
- Smoker Status (never, past, current)
- Body Mass Index (BMI)
- MaxVO^2
- Carotid Artery Intima-media Thickness (IMT)

Results

Among all Participants, Stepwise Multiple Regression analysis demonstrated IMT and BMI to be the Only Significant Independent Predictors of Satisfaction with Life (p=.004 & .0185, respectively).

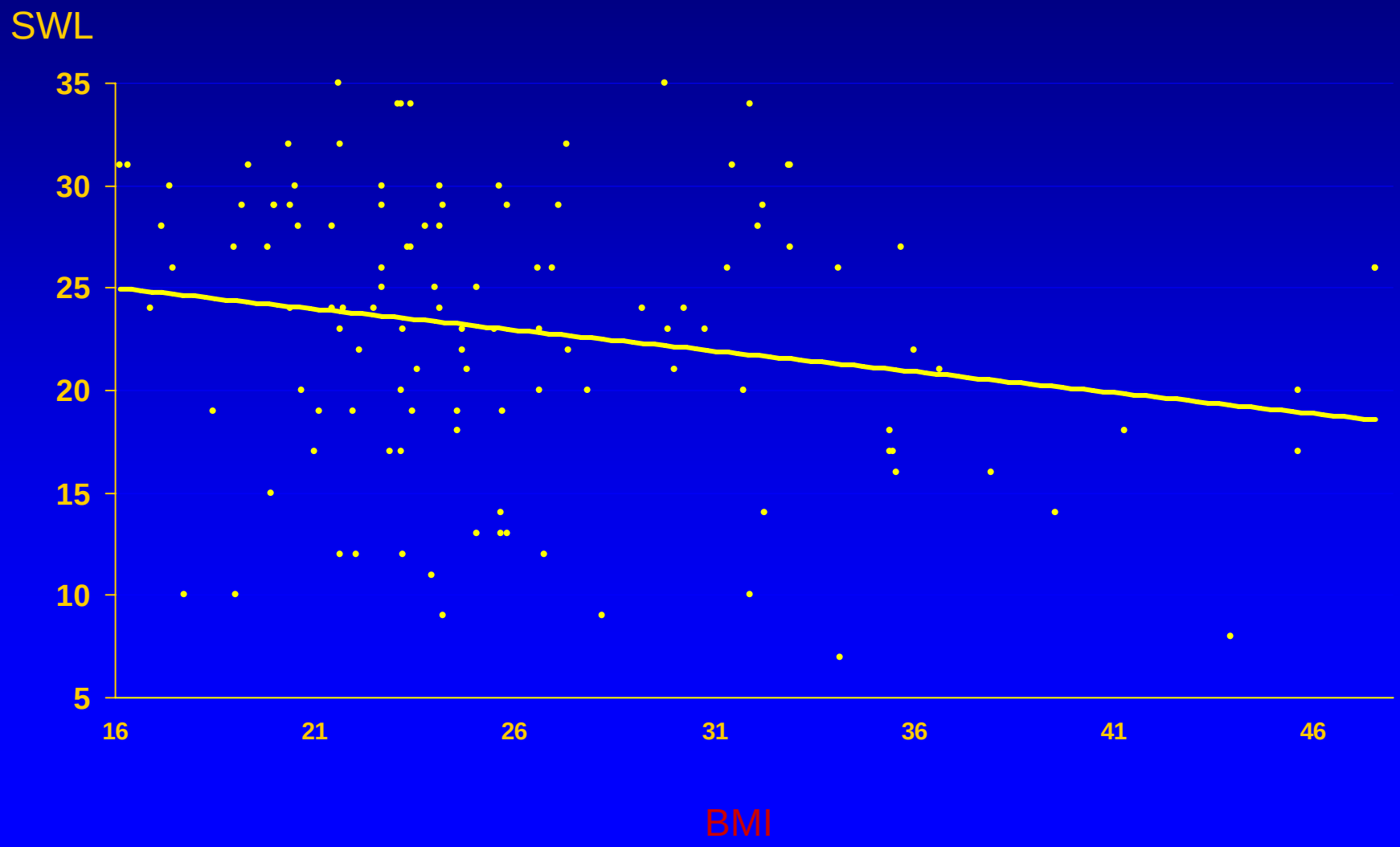
IMT & SWL

r = -.26, p=.0038



BMI & SWL

r = -.20, p=.0185



Results (cont.)

Subsequent Stepwise Multiple Regression analyses demonstrated Age, Hemoglobin A1c and Triglyceride Levels to be Significant Independent Predictors of IMT (p=.0001; .0049 & .0261, respectively); and Fasting Glucose Levels and Triglyceride Levels to be Significant Independent Predictors of BMI (p=.0047 & .021, respectively)

Results (cont.)

However, **no** predictors of IMT and BMI were correlated directly with SWL.

SWL &

Age,	r = -.07, n.s.
HbA1c,	r = -.01, n.s.
Triglycerides,	r = -.12, n.s.
Fasting Glucose,	r = -.10, n.s.

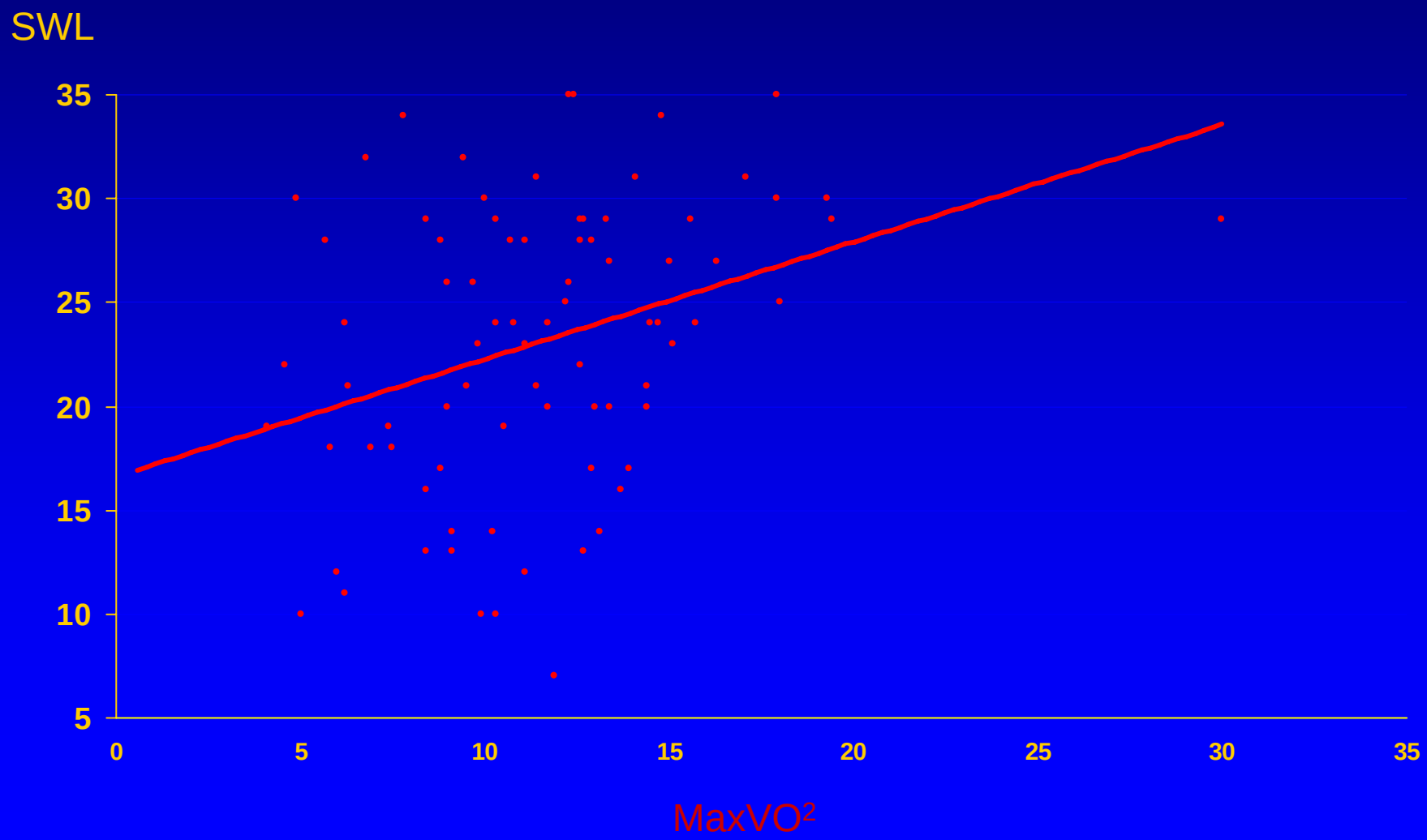
In addition, there were no correlations between Cholesterol or its factions and IMT, BMI or SWL.

Results (cont.)

Among those Participants capable of Exercise Testing (n=67), Stepwise Multiple Regression analysis demonstrated MaxVO^2 and IMT to be the Only Significant Independent Predictors of Satisfaction with Life (p=.0064 & .0071, respectively).

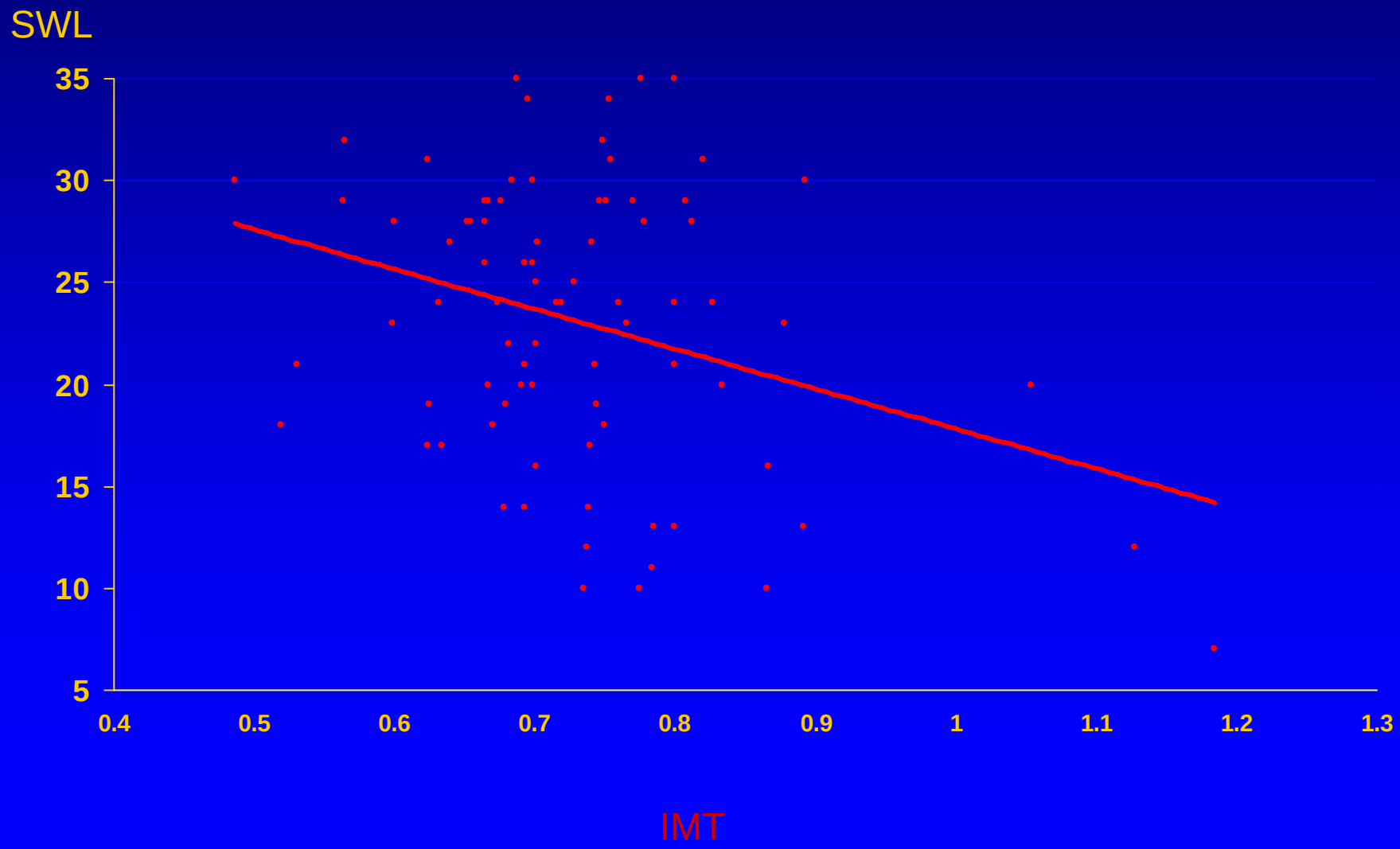
SWL & MaxVO^2

r = .312, p<.0064



SWL & IMT
Among Those with MaxVO^2

r = -.308, p<.0071



Results (cont.)

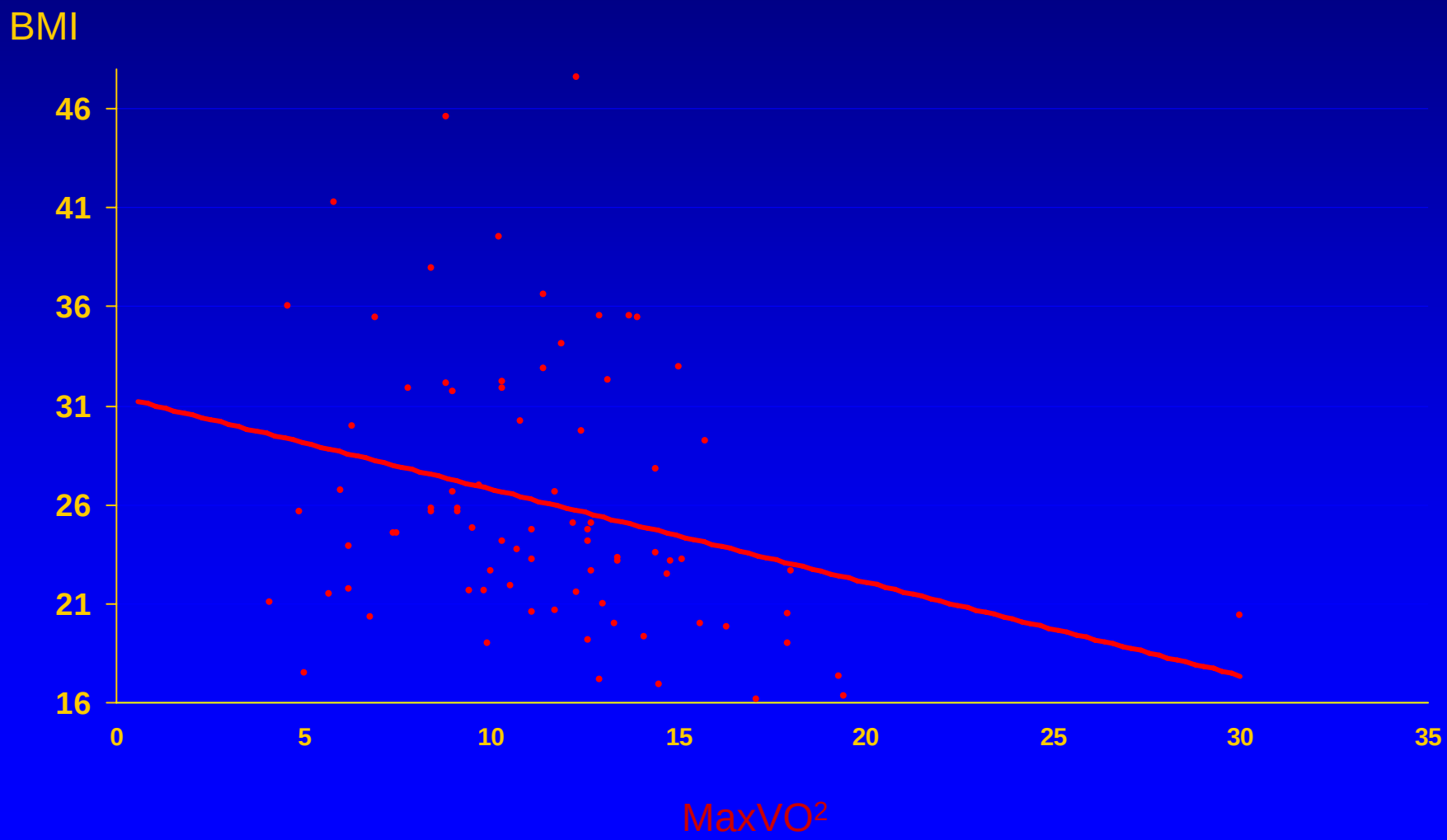
The Primary Significant Predictor of $MaxVO^2$ was impairment (p=.0088).

However, differences in SWL scores between impairment groups did not approach significance.

The only other Significant Predictor of $MaxVO^2$ was BMI (p=.0179)

BMI & MaxVO^2

r = -.28, p=.0179



Diet

Exercise

Fat

Abdominal

Glucose

Metabolism

Triglycerides

Cardiovascular

Heath

IMT

MaxVO2

QOL

The Effect of Diet in SCI

Purpose:

To evaluate the effects of simple dietary intervention in individuals with SCI and dyslipidemia

METHODS

Baseline and follow up serum lipids done in 222 individuals with chronic SCI

- Eighty six had cholesterol > 200mg and were referred to dietician
- The reminder with cholesterol < 200 mg clinical follow up

DIETARY INTERVENTIONS

Dietary recall

AHA and ADA type diets

Individually tailored

Recommended: Variety of food

Plenty of fruits and vegetables

Total fat <30 % of daily calories

RESULTS

Decreased in total cholesterol to 20% in dietary group

Decrease in triglicerydes in 69% of participants

Twenty percent had normalized total cholesterol

DIETARY INTERVENTION HAD NO EFFECT ON HDL CHOLESTEROL

TRIGLICERYDES

Component of metabolic syndrome

Increased values in pre-diabetic states

Decrease from 183 to 162 mg/dl in dietary group

Overall – 60% had some decrease in triglycerydes with diet

RECOMMENDATIONS

Lipid profile at baseline and annually if abnormal

Dietary intervention for those with mild abnormalities

Work up for CVD when significant abnormalities present

Weight Loss in Persons with Disabilities

Difficult to accomplish

Not well studied

Lack of populations studies

Effect of Physical Activities

- Beneficial to all
- Helpful in achieving weight loss
- A must in achieving reduction in abdominal adiposity
- Recommended as a part of comprehensive wellness program
- Moderate activities 3 to 5 days a week, at least 20 min duration

POTENTIALLY BENEFICIAL

Yoga

Relaxation

Deep breathing

Any other techniques for stress reduction